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| FRIEDRICH KUEFFNER | | | EXAMINER | |
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| NEW YORK, NY 10017 | | | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/527,207

Applicant(s)

WEBER, LUTZ

Examiner

JESSICA L. MYERS

Art Unit

3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 1/17/06.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date 3/10/05
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

In Reference to Claim 5

Regarding claim 5, the phrase "preferably" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

In Reference to Claim 13

Claim 13 recites the limitation "the base module" in line 2. There is insufficient antecedent basis for this limitation in the claim.

In Reference to Claim 14

Claim 14 recites the limitation "the disk plane" in line 4. There is insufficient antecedent basis for this limitation in the claim.

In Reference to Claim 15

Regarding claim 15, the phrase "preferably" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

In Reference to Claim 17

Claim 17 recites the limitation "the medium" in line 3. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-8, 11, 12, and 17-21 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 4,514,742 to Suga et al. (Suga et al.).

In Reference to Claim 1

Suga et al. teach a micropump (see figure 2) with a pump membrane (wall (102), see corresponding component in figure 1) which can be moved by modifying the volume of a pump chamber which is adjacent to the pump membrane and a base part (see columns 2-3, lines 64-2), also comprising two valves (first and second fluid control means (21 and 22)) which are arranged in recesses in the base part (as shown in figure 2) and react to the pressure in the pump chamber in order to alternately open and close an inlet channel and an outlet channel (nozzle and supply passage (14 and 15)) for a medium to be pumped, wherein the valves are formed without any common components by standalone functioning valve modules comprising a valve seat (valve seat (404)) and a valve body (401 and 407) (see module in figures 4C and 5C, and see columns 3-4 lines 50-2 for operation of valves).

In Reference to Claim 2

Suga et al. teaches the micropump according to claim 1 (see the rejection of claim 1 above), wherein both valve modules are identically constructed. Both valves can take the form of the embodiments shown in figures 3-10.

In Reference to Claim 3

Suga et al. teach the micropump according to claim 1 (see the rejection of claim 1 above), wherein hollows which are open toward the pump chamber are formed as recesses. See figure 2, where two recesses are used to hold the valves (22 and 21).

In Reference to Claim 4

Suga et al. teach the micropump according to claim 3 (see the rejection of claim 3 above), wherein the height of the valve module is equal to the depth of the hollow receiving the module. See figure 2, where the top of the valves (22 and 21) sit flush with the inner chamber of the base (pressure chamber (13)) in which the recesses are formed.

In Reference to Claim 5

Suga et al. teach the micropump according to claim 1 (see the rejection of claim 1 above), wherein the valve module (see figure 5C) is made of two parts with a preferably rotationally symmetrical seat component (seat component (506) is rotationally symmetric about its central axis), and a valve body (valve member (511)) preferably designed as a spring component for closing and opening of a preferably central opening in the seat component (see figures 5A and 5B).

In Reference to Claim 6

Suga et al. teach the micropump according to claim 5 (see the rejection of claim 5 above), characterized in that wherein the spring component exhibits a film (the spring component (511) can be made from a plastic film (see column 5 lines 52-58)) in which a lip element (supporting arms (510)) is formed through at least one cutout (the portions of film that have been cutaway) and attached at one end or at several ends with the remaining film (the arms are attached to the center of the film and an outer rim of the film, see figure 5C).

In Reference to Claim 7

Suga et al. teach the micropump according to claim 6 (see the rejection of claim 7 above), characterized in that wherein the cutout is a slot cutout following the contour of the lip element. The slots meet the edges of the lips (supporting arms (510)), and therefore follow the contour of the lips.

In Reference to Claim 8

Suga et al. teach the micropump according to claim 6 (see the rejection of claim 6 above), wherein the spring component is connected with the seat component in an outer ring area (peripheral stationary ring (503)) which is centered by the seat component, from which the lip element extends inwards (see figure 5C).

604) is elevated in relation to the central portion of the valve seat (606), which lifts the

In Reference to Claim 11

Suga et al. teach the micropump according to claim 8 (see the rejection of claim 8 above), wherein the lip element is connected with the ring area at two diametrical places or connected with the ring area at three places which are evenly distributed

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across the ring area. The lip elements connect to the ring four times in such a way that each connection has a connection that is diametrically opposite.

In Reference to Claim 12

Suga et al. the micropump according to claim 1 (see the rejection of claim 1 above), wherein it is composed of a base module (pressure chamber (103)) which receives the valve modules (see figure 2 with valve modules (21 and 22)) and comprises a base part (bottom of pressure chamber (103)) and hose connections (nozzle and supply passage (14 and 15) could be connected to hoses), and of a actuator module which includes the membrane and a piezo disk (piezo electric element (11)) connected to the membrane (wall (12)).

In Reference to Claim 17

Suga et al. teach the micropump according to claim 1 (see the rejection of claim 1 above), wherein at least the part of the pump which comes into contact with the medium is made of a plastic. Suga et al. teach that the valves can be made from a plastic film (see column 5 lines 52-58).

In Reference to Claim 18

Suga et al. teach the micropump according to claim 1 (see the rejection of claim 1 above), wherein the membrane is made of one piece or exhibits several layers of different material. The wall is made of a cold-rolled stainless steel plate (see column 5 lines 64-65).

In Reference to Claim 19

Suga et al. teach the micropump according to claim 1 (see the rejection of claim 1 above), wherein the membrane exhibits a recess facing the pump chamber, which preferably corresponds to the maximum pump chamber volume. When a voltage is applied to the piezoelectric element, the wall is curved and deformed, which would form a recess facing the pump chamber (see columns 2-3, lines 64-2).

In Reference to Claim 20

Suga et al. teach the micropump according to claim 1 (see the rejection of claim 1 above), wherein the membrane is cap-like and can be moved manually or with the help of an actuation which is temporarily or permanently attached to the membrane. The membrane forms a cap for the pressure chamber (103) and is moved by a electromechanical transducer means (101) which is fastened to the wall (102) (see columns 2-3 lines 64-2).

In Reference to Claim 21

Suga et al. teach a method for the serial production of micropumps according to claim 1 (see the rejection of claim 1 above), wherein the valve modules, base modules, which include the base part and connections, as well as the actuator modules which include the membrane, are prefabricated independently of one another and wherein the micropump is made up of these modules. The valves shown in figures 4C and 5C are created separately from the base (103), which is created separately from the wall (102) and piezo actuator (102). These components are then assembled together to form the apparatus.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suga et al. in view of U.S. Patent 4,966,185 to Schram (Schram).

In Reference to Claim 9

Suga et al. teach the micropump according to 5 (see the rejection of claim 5 above), but does not teach that the center of the valve seat has a raised portion.

Schram teaches a similar style valve (see figure 6A) where a center portion of the valve base (outer plate (4)) is raised around the around the central valve body portion (18). It would have been obvious to one of ordinary skill in the art at the time of invention to raise the central portion of the valves of Suga et al. in the manner of Schram to ensure that the valves remain closed when not experiencing fluid pressure and to prevent leakage of the pumped fluid.

In Reference to Claim 10

Suga et al. as modified by Schram teaches the micropump according to claim 9 (see the rejection of claim 9 above), wherein the seat component has an elevated rim seat by means which the lip element is lifted across its entire length from the floor plate (see figure 6A of Suga et al. where the lower valve seat (604) elevates the film with respect to the inner portion of the valve seat (606)).

5. Claims 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suga et al. in view of U.S. Patent 5,718,567 to Rapp et al. (Rapp et al.).

In Reference to Claim 13

Suga et al. teach the micropump according to claim 11 (see the rejection of claim 11 above), but does not specify the shape of the base module.

Rapp et al. teach a similar diaphragm pump where the base surrounds a disk shaped diaphragm (see diaphragm (2) shown in figure 3a). Because of this, the lower pump body (1) and the upper pump body (3) are both annular in shape and rotationally symmetric about the center of the diaphragm. It would have been obvious to one of ordinary skill in the art at the time of invention to form the base of Suga et al. in the shape of a circle so that it could be used in conjunction with a circular pumping wall or diaphragm.

In Reference to Claim 14

Suga et al. teach the micropump according to claim 1 (see the rejection of claim 1 above), but do not teach that the base is disk shaped, or that the inlet and outlet channel extend perpendicularly to the plane of the disk.

Rapp et al. teach a similar diaphragm pump where the base surrounds a disk shaped diaphragm (see diaphragm (2) shown in figure 3a). Because of this, the lower pump body (1) and the upper pump body (3) are both annular in shape and rotationally symmetric about the center of the diaphragm. It would have been obvious to one of ordinary skill in the art at the time of invention to form the base of Suga et al. in the

shape of a circle so that it could be used in conjunction with a circular pumping wall or diaphragm.

Additionally, Rapp et al. teach that the inlet and outlet channels (11 and 12) lie perpendicular to a plane defined along the bottom of the base (1). It would have been obvious to one of ordinary skill in the art at the time of invention to form the inlet and outlet channels of Suga et al. such that they extend vertically through the pump base, in the manner taught by Rapp et al., since doing so would allow excess pump fluid trapped in the channels to leak back into the tank reservoir or out through the nozzle.

In Reference to Claim 15

Suga et al. as modified by Rapp et al. teaches the micropump according to claim 13, wherein a seat for the actuator module is formed on the base part (upper annular ring of pressure chamber (103) forms the seat for wall (12), as seen in figure 2 of Suga et al.), and preferably the pump membrane rests over a support ring on a ring shoulder located on the base part (the ring shoulder is the upper portion of the base (103)).

In Reference to Claim 16

Suga et al. as modified by Rapp et al. teaches the micropump according to claim 13, wherein the base module is formed in one piece with the hose connections (see figure 2 of Suga et al., where the nozzle and supply passages (14 and 15) could be used as hose connections).

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JESSICA L. MYERS whose telephone number is (571)270-5059. The examiner can normally be reached on Monday through Friday, 8:30am to 5:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on 571-272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

7. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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